

Appl. No. 09/517,345
Amdt. dated March 22, 2004
Reply to Office Action of November 20, 2003

PATENT

AMENDMENTS TO THE DRAWINGS:

The attached sheets are formal drawings for Fig. 1, 2, 3, 4, 5, 6, 7, 8, 9A-F, 10A-E, 11A-F, and 12A-C. These sheets, which includes Fig. 1, 2, 3, 4, 5, 6, 7, 8, 9A-F, 10A-E, 11A-F, and 12A-C, replace the original sheets including Fig. 1, 2, 3, 4, 5, 6, 7, 8, 9A-F, 10A-E, 11A-F, and 12A-C.

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

STATUS OF THE APPLICATION

Claims 1-25 and 49-70 are pending in this application. Claims 1, 9, 17, 20, 25, 49, 62, 67, and 69 were amended. Support for the amended claims can be found in the specification. No new matter has been added.

Examiner objected to drawings under 37 CFR 1.83(a). In addition, the PTO Draftsperson objected to the drawings for various informalities.

Claims 20 and 20-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,866,949 to Schueller ("Schueller").

Claims 1, 2, 4, 6-10, 12-16, 18, 19, 49-59, and 61 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schueller in view of U.S. Patent 6,246,010 to Zenner et al ("Zenner").

Claim 21 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Schueller in view of admitted prior art ("APA").

Claims 25 and 62-69 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schueller in view of Zenner and APA.

Claims 3, 5, 11, 60, and 70 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schueller and Zenner and further in view of APA.

Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Schueller and Zenner and further in view of U.S. Patent 5,976,912 to Fukutomi et al. ("Fukutomi").

THE DRAWINGS

As claim 17 has been amended, Applicants respectfully request Examiner withdraw his objection to the drawings. Formal drawing are submitted herewith to address the objections of the PTO Draftsperson.

THE CLAIMS

Reconsideration and allowance of the claims are respectfully requested in light of the amendments to the claims and following remarks.

Claims 20-24

Applicants submit that the features of the present invention recited in claim 20 are not made obvious by Schueller, and have further amended the claims to distinguish the present invention from the cited reference.

For example, in order to emphasize the surface between the metallized polymer layer and transition medium of the present invention, claim 20 recites, in part, "at least one solder ball, the at least one solder ball and metallized polymer layer comprise a flat surface." As shown in Applicants' Fig. 6, metallized polymer layer 20 and solder ball 14 create a flat surface for coupling with transition medium 42.

(Applicants' specification: Fig. 6). Schueller fails to teach or suggest this element. Examiner analogizes flexible dielectric tape substrate 59, 60 to the metallized polymer layer. (Office Action: p. 3). As can clearly be seen in Figs. 3A and 3B of Schueller, flexible dielectric tape substrate 59, 60 does not define a flat surface in the manner claimed. In fact, conductive layer 59 is discontinuous.

Claim 20 also recites, in part, "a first edge of the transition medium is coincident with a first edge of the die, and a second edge of the transition medium is coincident with a second edge of the die." In other words, edges of transition medium 42 define the same boundaries as edges to silicon die 18. (Applicants' specification: Figs. 6, 9A-F, 10A-E, and 11A-F). On the contrary, Schueller describes the opposite of the invention: nonpolymer support structure 50 of Fig. 3A and metal sheet 53 of Fig. 3B extend further out than semiconductor die 52. This permits Schueller to place ground pads on semiconductor die 52 to connect to the ground solder balls 54a through inner leads or by wire bonds 82b. (Schueller: col. 9., lines 30-33).

In addition, claim 20 recites, in part, "a mold cap encapsulating the transition medium and the die, the mold cap defining a second thickness." Examiner

relies on Fig. 3B and col. 8, line 40 of Schueller as teaching this element. However, as seen in Fig. 3B of Schueller, the alleged mold cap also encompasses conductive layer 59, which Examiner has analogized to be a component of the metallized polymer layer. Thus, Applicants respectfully submit that the mold cap in Schueller defines a second thickness that includes, in part, the first thickness. As a result, the first thickness and second thickness do not define the package thickness in the manner claimed.

Accordingly, claim 20 should be allowed for at least these reasons. Claims 21-24, which depend from claim 20, should be allowed for at least a similar rationale as discussed for claim 20, as well as for the additional elements they recite.

Claims 1-19 and 70

Applicants submit that the features of the present invention recited in claim 1, are not made obvious by Schueller in view of Zenner, and have further amended the claims to distinguish the present invention from the cited references.

For example, in order to emphasize the coincident boundaries defined by the edges of transition medium and the silicon die, claim 1 recites, in part, "a first edge of the transition medium is coincident with a first edge of the silicon die, and a second edge of the transition medium is coincident with a second edge of the silicon die." As discussed above with respect to claim 20, Schueller fails to teach or suggest this element as claimed. Zenner is cited merely for allegedly disclosing a die thickness of about less than 100 microns or preferably less than 20 microns and a package thickness of about 275 microns, but it does not cure the deficiencies of Schueller. Nowhere does Zenner teach or suggest "a first edge of the transition medium is coincident with a first edge of the silicon die, and a second edge of the transition medium is coincident with a second edge of the silicon die," and therefore the combination of Schueller and Zenner still falls short of the present invention.

Therefore, claim 1 should be allowed for at least this reason. Claims 2-19 and 70 which depend from claim 1, should be allowed for at least a similar rationale as discussed above for claim 1, as well as the additional elements they recite.

Claims 49-61

Claim 49 recites, in part, "a first edge of the transition medium is coincident with a first edge of the integrated circuit die, and a second edge of the transition medium is coincident with a second edge of the integrated circuit die." As discussed above for claims 1 and 20, the cited references fail to teach or suggest this element. Therefore, claim 49 should be allowable for at least this reason. In addition, claims 50-61, which depend from claim 49, should be allowed for at least a similar rationale as claim 49, as well as the additional elements they recite.

Claims 25, 62-69

Applicants submit that the features of the present invention recited in claim 25, are not made obvious by Schueller in view of Zenner and APA. For example, claim 25 recites "a first edge of the transition medium is coincident with a first edge of the die, and a second edge of the transition medium is coincident with a second edge of the die." As discussed above, Applicants submit that such a concept of coincident edges is not taught or suggested by Schueller, Zenner, or APA, considered individually or in combination. Accordingly, claim 25 should be allowed for at least this reason.

Claim 62, which also recites, in part, "a first edge of the transition medium is coincident with a first edge of the silicon die, and a second edge of the transition medium is coincident with a second edge of the silicon die," should be allowable for at least the same reasons as discussed above. Claims 63-66, which depend on claim 62, should be allowable for at least a similar rationale as claim 62, as well as the additional elements they recite.

Similarly, claims 67 and 69 recite a first edge of the transition medium is coincident with a first edge of the silicon die, and a second edge of the transition medium is coincident with a second edge of the silicon die. Claims 67 and 69 should be allowed for at least the reason discussed above. Claim 68, which depend from claim 67, should be allowed for at least being dependent on allowable subject matter.

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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal notice of allowance at an early date is respectfully requested.

If the examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400, extension 5434.

Respectfully submitted,



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